



RESEARCH PAPER

Evaluation of infiltration and rainfall-runoff attributes by utilizing a rainfall simulator

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Abstract : The impact of different land management practices on the amount of runoff and infiltration was studied in a laboratory for a period from August to December (2018) by simulating the natural conditions. Special trays were designed to hold a unique soil surface cover and rain was artificially poured onto them from a pre-determined height using a rainfall simulator designed to provide rainfall at a constant rate of 100 mm/h for a duration of 15 minutes with a soil slope of 5%. Five different land covers were studied and the results evaluated signified that concrete surface of urban environment offered more runoff about 99%, while greater sediment loss is found in intensely tilled soil cover (640 g) as compared to minimum tillage (320 g), no-till system (210 g) followed by perennial herb system. In minimum tilled soils having a 30% residue cover, the obstructions in the flow pathway of runoff water increased the infiltration amount to almost 30% for the same rainstorm event. For the compact no-till surface, runoff amount was found to 92% of the incident rainwater with a little infiltration as such the surface was closely an impervious one. However, for such an intense rainstorm, perennial vegetation produced a little runoff and almost 96% of rainwater was either retained in the vegetative canopy or infiltrated below.

Key Words : Infiltration, Rainfall simulator, Runoff, Sediments, Simulation

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